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ABSTRACT

In two experiments, the ability of children younger than 20 months to engage in delayed ordered recall was investigated. In the first experiment, 13- and 16-month-old children were presented with 2-step event sequences and tested for recall, first, immediately following the event and second, after a one-week delay. Sequences were novel-causal, novel-arbitrary, or familiar. Results indicated that 16-month-olds produced more correctly ordered sequences than did 13-month-olds, and both groups produced more correct sequences for causal events than for arbitrary or familiar events. In the second experiment, 16-month-old children were presented with three-step event sequences and tested for immediate recall and recall with a verbal reminder. Results indicated that: (1) children produced more correctly ordered sequences for causal and familiar sequences than for arbitrary sequences; and (2) given a reminder, 16-month-olds were able to remember longer sequences after a delay. A list of three references is included. (BC)

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Hertsgaard, L. & Bauer, P. J. (1990). Thirteen- and sixteen-month olds' long-term recall of event sequences. Poster presented to the Society for Research in Child Development, Seattle.

ABSTRACT

Previous research has shown that children as young as 13 months include temporal information in their representations of events; 20-month olds maintain organized representations over delays as long as 2 to 6 weeks. In two experiments, elicited imitation was used to investigate the ability of children younger than 20 months to engage in delayed ordered recall. In Experiment 1, 13- and 16-month olds maintained organized representations of short sequences over a 1-week delay, particularly if the sequences were characterized by causal relations. Experiment 2 showed that with the addition of a simple "reminding" procedure, this finding extended to recall of longer sequences over the same delay. These two studies provide evidence that given short sequences and/or increased contextual support, children younger than 20 months can maintain temporal order information over a delay.

BACKGROUND

For preschool-age children as well as adults, recall of event sequences is facilitated by familiarity and by causal and enabling relations. Events that are arbitrarily ordered are less well recalled. **Familiar** sequences are based on routine activities like "taking a bath"; **causal** sequences contain actions that must be performed in a certain order (i.e. A must occur before B); **arbitrary** sequences contain actions that can occur in any order.

Immediate Recall

When tested immediately after modeling, patterns of recall similar to those seen in older children and adults have been observed for children as young as 13 months:

(1) Using elicited imitation of 3-step action sequences, Bauer & Mandler (1989) demonstrated that 16- and 20-month-olds have well ordered immediate recall for both familiar sequences and for novel sequences containing causal relations. Novel-arbitrarily ordered sequences were less well recalled.

(2) Bauer & Mandler (1991) also tested 13-month-olds on 2- and 3-step familiar and novel-causal sequences. Immediate ordered recall was good for both types of events; novel-arbitrary sequences were not tested.

Delayed Recall

When tested after a delay of as much as 6 weeks, children 20 months and older recall events in the correct temporal order (Bauer & Mandler, 1989; Bauer & Shore, 1987).

HOWEVER, even with a shorter delay, 16-month-olds have not shown the ability to remember the order of event sequences. They are able to recall only the individual components of the events. Delayed ordered recall by children younger than 16 months has yet to be assessed.

QUESTION

Is 20 months the lower limit on the ability to maintain temporal order information over a delay? Or, would simplifying the events and/or the recall procedure enable children younger than 20 months to maintain well-organized representations over a delay?

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STUDY 1: Simplified Sequences

METHOD

Subjects: Fourteen 13-month and fourteen 16-month-old children participated in 2 laboratory sessions separated by 1-week.

Procedure: Elicited imitation was used to test all children on six **2-step** event sequences;

2 novel-causal
2 novel-arbitrary
2 familiar

Order of presentation was completely counterbalanced.

Sequence Type	Step One	Step Two
Novel-Causal		
"Make a rattle"	put button in box	shake the box
"Make the car go"	make a ramp	push car down ramp
Novel-Arbitrary		
"Big Bird goes for a ride"	put Big Bird in truck	load blocks in truck
"Make a pretty plant	shovel dirt into pot	put flower in pot
Familiar		
"Give Teddy Breakfast	put Teddy in the chair	feed him the banana
"Clean the table"	wipe table with towel	throw towel in trash

Measures: The mean number of correctly ordered pairs of actions was assessed for a spontaneous period and an immediate recall period at **session 1**, and a delayed recall period at **session 2.**

(1) **Spontaneous** = The child's performance prior to modeling or instruction.

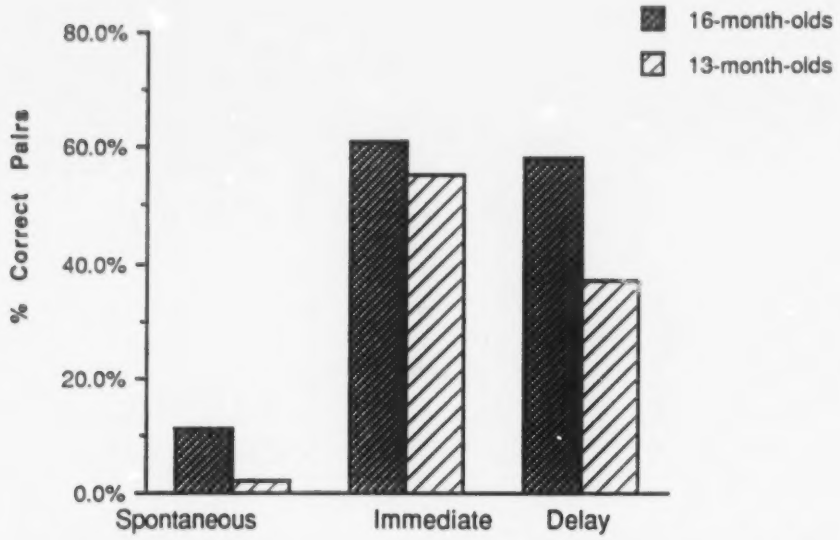
(2) **Immediate Recall** = The experimenter models the sequence 2 times, with narration, and the child is encouraged to imitate. The child's performance after modeling is taken as the measure of immediate recall.

(3) **Delayed Recall** = The child's performance at session 2, following the 1-week delay. The sequence is not remodeled for the child, nor are any instructions given.

RESULTS

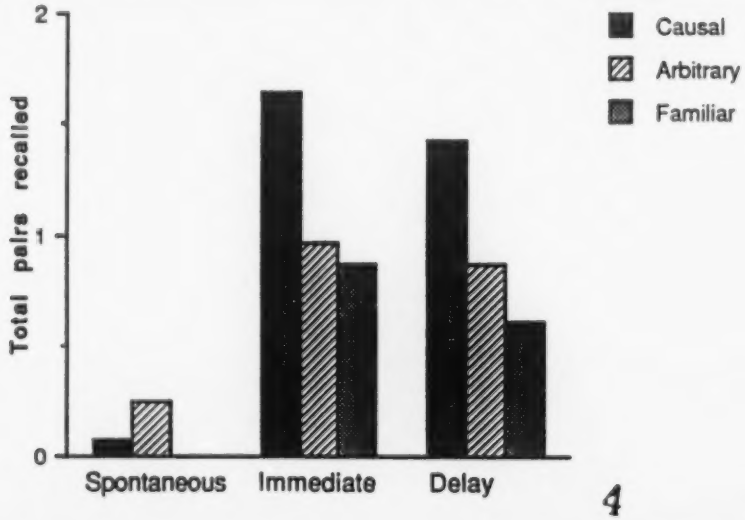
(1) Overall, 16-month olds produced correctly ordered sequences on a greater percentage of trials than did 13-month olds.

Patterns of Recall for 13- and 16-month-old Children



(2) Both age groups produced correctly ordered sequences for causal events more often than for arbitrary or familiar events. Performance on arbitrary and familiar sequences was equivalent.

STUDY 1
Number of Correct Pairs for each Sequence Type



(3) The results suggest that for 13- and 16-month olds, recall is facilitated by causal relations, but not necessarily by familiarity.

(4) HOWEVER, analysis of children's ordering errors (i.e. reversals) suggests otherwise. Specifically, when you look at what children did **wrong** in addition to what they did **right**, it is apparent that familiarity does facilitate recall, at least for 16-month olds.

Analysis of Errors (Reversals)

13-Month-Olds' % Errors (Reversals)

	IMMEDIATE	DELAY
Causal	.00*	.00*
Arbitrary	.19*	.40
Familiar	.15*	.40

16-Month-Olds % Errors (Reversals)

	IMMEDIATE	DELAY
Causal	.00*	.00*
Arbitrary	.33	.35
Familiar	.25*	.17*

Where 2 actions were produced:

Causal - 100% were correctly ordered for both age groups. This was true at both immediate and delayed testing.

Arbitrary - On average, children produced paired actions in the wrong order 32% of the time. Their performance on arbitrary sequences was generally not above that expected by chance (chance = 50%).

Familiar -

13-month olds produced few ordering errors immediately after modeling. Performance after the delay was not above chance.

16-month olds produced few ordering errors even after the 1-week delay. Performance was consistently above chance.

(5) Results of the study suggest that for short (2-step) sequences, children younger than 20 months can remember the order of events over a delay:

(a) **13-month olds** recall causal sequences.

(b) **16-month olds** recall both familiar and causal sequences.

STUDY 2: Simplified Recall

METHOD

Subjects: Twelve 16-month-old children participated in 2 laboratory sessions separated by 1-week.

Procedure: As in Study 1, elicited imitation was used to test children on 6 event sequences. All sequences were **3-steps** long;

2 novel-causal
2 novel-arbitrary
2 familiar

Order of presentation was completely counterbalanced.

Sequence Type	Step One	Step Two	Step Three
Novel-Causal			
"Make spaghetti"	put dough in press	press lever	cut spaghetti"
"Make a rattle"	put ball in cup	cover	shake
Novel-Arbitrary			
"Make a party hat"	put on the top	put on the ribbon	put on bow
"Draw a picture"	put sticker on board	draw with chalk	put on stand
Familiar			
"Give Teddy a both"	take off Teddy's shoes	put Teddy in tub	wash him
"Put Fozzie to bed"	put bear on bed	cover with blanket	read story

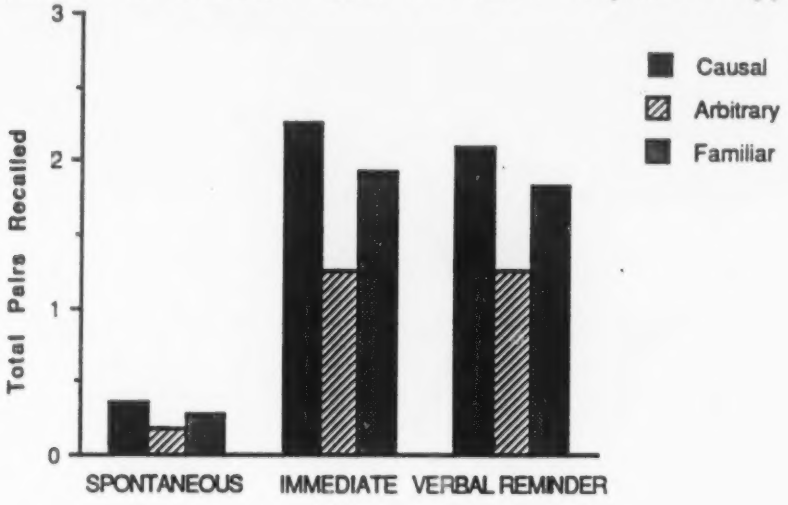
At **session 1**, the spontaneous and immediate recall periods were identical to those in Study 1. At **session 2**, children were given a verbal reminder of the event (e.g. "last time we gave teddy a bath. Can you give teddy a bath?"). Children were then given the opportunity to reproduce the event.

Measures: The mean number of correctly ordered pairs of actions was assessed for the spontaneous and immediate recall periods at session 1, and for the verbal reminder period at session 2.

RESULTS

(1) Children produced more correctly ordered pairs of actions on causal and familiar sequences relative to arbitrary ones. Correct ordered production on causal and familiar sequences was equivalent.

STUDY 2
Number of Correct Pairs for each Sequence Type



(2) Analysis of children's ordering errors, i.e. reversals, reveals that recall is facilitated by causal relations as well as by familiarity.

Analysis of Errors (Reversals)

STUDY 2 % Errors (Reversals)

	IMMEDIATE	VERBAL DELAY
Causal	.16*	.05*
Arbitrary	.32	.36
Familiar	.22*	.23*

As in Study 1, when pairs of actions were produced:

Causal - Children produced very few errors. This was true at both immediate and delayed testing.

Arbitrary - On average, children produced pairs of actions in the wrong order 34% of the time. Performance on the arbitrary sequences was not above chance.

Familiar - Children produced relatively few ordering errors, even after the 1-week delay. Performance was consistently above chance.

(3) Results of Study 2 suggest that given a simple reminder, 16-month olds are able to remember longer sequences over a delay.

CONCLUSIONS

(1) 13- and 16-month old children recall short event sequences in the correct order, both immediately and after a delay.

(2) Given a reminder, 16-month olds recall longer sequences over the same delay.

(3) As for older children and adults, recall of events is facilitated by causal and familiar relations.

(a) by 13-months, recall is facilitated by causal relations.

(b) by 16-months, recall is facilitated by familiar as well as by causal relations.

References

Bauer, P.J. & Mandler, J.M. (1991). Putting the horse before the cart: The use of temporal order in recall of events by one-year old children. Manuscript in review.

Bauer, P.J. & Manderl, J.M. (1989). One thing follows another: Effects of temporal structure on 1- to 2-year-olds' recall of events. *Developmental Psychology*, 25, 197-206.

Bauer, P.J. & Shore, C.M. (1987). Making a memorable event: Effects of familiarity and organization on young children's recall of action sequences. *Cognitive Development*, 2, 327-338.